Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1.   (Twice Amended) A computer-implemented method of mirroring a component of a three-dimensional object modeled in a computer-simulated three-dimensional modeling space, the method comprising:

receiving data to select a first component of the three-dimensional object;

applying a plurality of transformations to the first component to determine a plurality of candidate orientations;

automatically analyzing [a]the plurality of candidate orientations to select a preferred orientation for creation of a reproduction of the first component;

selecting one of a plurality of procedures for constructing a new component, the plurality of procedures comprising a truly mirrored copy procedure and a copy procedure, the copy procedure utilizing one of the plurality of transformations; and

creating [a]the new component of the three-dimensional object that is the reproduction of the first component in the preferred orientation, the new component being created using the selected procedure and being created based on a position of the first component with respect to a surface said surface comprising a plane of symmetry positioned in the three-dimensional modeling space and wherein said surface is not a component of the three-dimensional object.

2. (Original) A computer-readable data storage apparatus comprising instructions for configuring a computer system to perform the method of claim 1.

3. (Original) The method of claim 1 further comprising receiving input from a user to position the surface in the three-dimensional modeling space.

4. (Original) The method of claim 1 wherein:

    the surface comprises a plane logically separating the modeling space into a first and a second section; and

    the first component is positioned in the first section of the modeling space; and

    creating the new component comprises creating the new component in the second section.

5. (original) The method of claim 4 wherein:

    the first component comprises a first plurality of vertices; and

    creating the new component comprises determining a second plurality of vertices, each vertex in the second plurality corresponding to a vertex in the first plurality, and each vertex in the second plurality being determined based on a position of said corresponding vertex with respect to the plane.

6. (original) The method of claim 4 wherein creating comprises creating such that the first and the new component are in symmetrical positions with respect to the plane.

7. (Cancel)

8. (original) The method of claim 1 wherein:

the first component comprises a plurality of first sub-components; and

creating the new component comprises creating a plurality of new sub-components, each of

the new sub-components corresponding to one of the first sub-components.

9. (Twice Amended) The method of claim 8 [further comprising] wherein:

applying the plurality of transformations comprises applying a plurality of transformations to

each of the first sub-components to determine the plurality of candidate orientations of

each corresponding new sub-component; and wherein the method further comprises

analyzing each of the candidate orientations of each of the new sub-components to determine

existence of a candidate orientation meeting a predetermined selection criteria indicative

of a preferred transformation.

10. (Previously Amended) The method of claim 9 further comprising:

based on said predetermined selection criteria, determining ones of the new sub-components

that are to be created as truly mirrored sub-components and ones of the new sub-

components to be created as replicated components.

11. (Previously Amended) The method of claim 10 further comprising generating a bill of

materials wherein:

for each of the first sub-components that is reproduced as a truly mirrored

sub-component, said first sub-components and said truly mirrored sub-components

are represented in the bill of materials as different line items; and

for each of the first sub-components that is reproduced as a replicated sub-component, said first sub-components and said replicated sub-components are represented in the bill of materials as instances of the same line item.

12. (Twice Amended) A computer-implemented method for generating components of an object modeled in a three-dimensional modeling space provided by a computer aided design system, the method comprising:

positioning a plane in the three-dimensional modeling space to logically subdivide the modeling space into a first division comprising a first component and a second division in which a reproduction of the first component is to be located and to define a reference geometry for creation of the reproduction of the first component, wherein said plane is not a component of the object modeled in the three-dimensional modeling space;

computing a plurality of geometrically transformed components by applying a plurality of different transformations to the first component, each transformed component comprising a different orientation of the first component; and

constructing the reproduction of the first component based on one of the plurality of geometrically transformed components such that the first component and the reproduction are symmetrical to each other with respect to the plane;

wherein each one of the plurality of different transformations comprises a transformation positioning a principal axes and a centroid of the first component at a position in the second division of the modeling space and is symmetric to the position of a principal axes and centroid of the first component.

13. (original) A computer-readable data storage apparatus comprising instructions for configuring a computer system to perform the method of claim 12.

14. (original) The method of claim 12 wherein constructing the reproduction comprises:

determining a preferred geometric transformation of the first component for use in constructing the reproduction by comparing locations of geometric features of the transformed components.

15. (Previously Amended) The method of claim 14 wherein:

the first component comprises a plurality of sub-components;

computing the plurality of geometrically transformed components comprises, for each one of the plurality of sub-components, applying a plurality of transformations to said each one of the plurality of sub-components; and

determining a preferred geometric transformation comprises determining for each one of the plurality of sub-components a manner in which to construct a corresponding reproduction.

16. (Previously Amended) The method of claim 15 wherein the manner in which to construct the corresponding reproduction is selected from the group consisting of generating a truly mirrored component and generating a replicated component.

17. (Previously Amended) The method of claim 16 further comprising generating a bill of materials comprising a plurality of line items, the bill of materials being generated such that:

a first one of the first plurality of sub-components and a corresponding truly mirrored component are represented as different line items; and

a second one of the first plurality of sub-components and a corresponding replicated component are represented by different instances of the same line item.

18. (Previously Amended) The method of claim 14 wherein:

the first component comprises a first plurality of vertices;

comparing locations of geometric features comprises comparing locations of vertices;

comparing locations of vertices comprises:

> computing a plurality of mirrored vertices, each mirrored vertex corresponding to one of the first plurality of vertices, such that each mirrored vertex and said corresponding one of the first plurality of vertices are equidistant to the plane and positioned on different sides of the plane; and

> for each one of the transformed components, computing an acceptance value based on a difference between locations of vertices of the transformed component and locations of the plurality of mirrored vertices, the acceptance value indicative of a preferred transformation.

19. (Previously Amended) The method of claim 18 wherein the acceptance value is a standard deviation value and the method further comprises determining a preferred geometric transformation by comparing the standard deviation value for each of the transformed components to a predetermined criteria indicative of a preferred transformation.

20. (Cancel).

21. (Previously Amended) The method of claim 12 further comprising:
> storing a data structure associating the first component and the reproduction; and
> initiating an update of the reproduction in response to a change in the structure of the first component.

22. (Previously Amended) The method of claim 15 further comprising:

logically integrating the reproduction into the modeled object such that the modeled object

comprises both the first component and the reproduction; and

storing a data structure to establish a mating relationship between the corresponding

reproduction of a first one of the plurality of sub-components and the corresponding

reproduction of a second one of the plurality of sub-components, said data structure

comprising data to initiate a corresponding positional transformation of the corresponding

reproduction of the first one of the plurality of sub-components in response to a positional

transformation of the corresponding reproduction of the second one of the plurality of

sub-components.

23. (Previously Amended) The method of claim 22 wherein:

the mating relationship comprises a type selected from a group consisting of parallel, angle,

coincident, concentric, distance, perpendicular, and tangent.

24 (Previously Amended) The method of claim 22 further comprising:

automatically creating the mating relationship to mate a geometric feature of the

corresponding reproduction of the first one of the plurality of sub-components with a

corresponding geometric feature of the corresponding reproduction of the second one of

the plurality of sub-components.

25. (Previously Amended) A computer-aided design system for processing data representing

construction of a three-dimensional object, the system comprising:

a processing unit coupled to a program storage medium, the program storage medium

comprising instructions to configure the processor to:

calculate a plurality of orientations for a first component with respect to a plane of

symmetry, wherein said plane of symmetry is not a component of the constructed

three-dimensional object, each one of the plurality of orientations comprised of a

plurality of vertices;

calculate a plurality of reflected vertices for the first component;

compute a plurality of standard deviation values, one deviation value computed for the

plurality of vertices of each one of the plurality of orientations and the plurality of

reflected vertices; and

construct a first reproduction of the first component in a manner determined by the

plurality of deviation values.

26. (Previously Amended) The system of claim 25, wherein the program storage medium further
comprises instructions to configure the processor to:

compute one of the plurality of deviation amounts equal to a result considered zero; and

construct the first reproduction by replicating the first component.

27. (Previously Amended) The system of claim 25 wherein the program storage medium further
comprises instructions to configure the processor to:

compute the plurality of deviation amounts equal to a result considered non-zero; and

construct the first reproduction by reflecting the first component.

28. (Previously Amended) The system of claim 25 wherein the instructions to configure the processor to calculate the plurality of orientations for the first component comprises instructions to:

      construct a plurality of transformations; and

      apply each one of the plurality of transformations to a plurality of geometric features of the first component.

29. (Previously Amended) The system of claim 25 wherein the program storage medium further comprises instructions to configure the processor to:

      build a hierarchical data structure comprising a hierarchical relationship between the first component and a second component;

      construct a second reproduction, the second reproduction symmetrically positioned with respect to the second component and the plane;

      include the first reproduction and the second reproduction in the hierarchical data structure; and

      establish the hierarchical relationship between the first reproduction and the second reproduction.

30. (Previously Amended) The system of claim 25 wherein the program storage medium further comprises instructions to configure the processor to:

      create a mating relationship between the first reproduction and a second reproduction corresponding to a second component.

31. (Previously Amended) The system of claim 30 wherein the program storage medium further comprises instructions to configure the processor to:

determine a first geometric entity belonging to the first reproduction, the first geometric

entity similarly positioned to a reflected first mated geometric entity belonging to the first

component;

determine a second geometric entity belonging to the second reproduction, the second

geometric entity similarly positioned to a reflected second mated geometric entity

belonging to the second component; and

define the mating relationship using the first geometric entity and the second geometric

entity.